Space Weather Forecast

Issued on Sunday, 27 March 2022 at 13:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic Storm intervals days 1 & 2 (27th & 28th). Chance of Moderate class flares throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with a single common-class flare from the southeast limb at 26/1540UTC. There are currently 4 sunspot regions on the visible disc. The two largest and most complex regions are in the northeast quadrant, and both have shown signs of development over the past 12-24 hours. The much smaller group in the southeast (which produced the M1 flare on 25th) has been inactive and continued to decline. A new region has developed in the northern hemisphere near central disc, but remains small and simple.
No Earth directed coronal mass ejections (CMEs) were observed in the available imagery, though a glancing blow remains possible from a coronal mass ejection originating on the 25th.

Solar Wind / Geomagnetic Activity: The solar wind appears to indicate the arrival of a positive coronal hole high fast wind. Solar wind speeds were generally stable between 400 and 450 km/s, but rose from 27/0500 UTC to around 500-550 km/s. The strength of the interplanetary magnetic field was mostly weak, but has risen to moderate levels at times from 26/1830 UTC. The north south component strengthened, with a largely positive orientation. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low, with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: A glancing impact is likely later on the 27th into the 28th from the CME which left the Sun on the 25th March. Otherwise, solar winds are expected to be elevated until day 3 (29th) due to a coronal hole fast wind. Quiet to Unsettled geomagnetic activity will occasionally become Active during days 1 and 2 (27th and 28th), with Minor Storm intervals possible from the potential CME arrival. Geomagnetic activity is expected to become predominantly Quiet through day 3 (29th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	40	60	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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